

## **Request for Proposals (RFP) for School Bus Camera Systems**

**Issued by: Avon Community School Corporation**

**Date: 2/22/2025**

### **Introduction:**

Avon Community School Corporation is seeking proposals from qualified vendors to provide and install comprehensive school bus camera systems. The objective is twofold:

- 1) Enhance the safety and security of our students and staff by equipping each school bus with state-of-the-art surveillance technology.
- 2) Ensure all district buses have the ability to automatically download security camera footage from each bus to a centralized cloud-based location.

Technical Evaluation Criteria of Proposed Solutions is located in Appendix A of this document.

### **Scope of Work:**

1. Your proposal is to include all the security cameras, mounting hardware, installation services, cloud space, storage device, and Wi-Fi enabled units. Your proposal shall be all inclusive including any and all shipping costs, storage fees and any additional equipment needed to successfully complete this project. Avon Community School Corporation is tax exempt, and your proposal shall not include any sales taxes. The wireless devices within the buses do not need to provide wireless service to the occupants of the buses, and they are not to be cellular enabled. No proposal can be submitted that includes equipment or components for equipment from companies deemed to provide a national security risk as defined by FCC order 19-121 and 47 CFR 54.9.
2. **Camera Specifications:**
  - a. Each school bus shall be outfitted with six (6) HD quality cameras.
  - b. Cameras must have onboard DVR recording capability.
  - c. Wireless transfer of video data to cloud services must be supported.
3. **Installation Requirements:**
  - a. Complete onsite installation of the camera systems.
  - b. Installation shall commence in spring 2025 and must be completed by July 15, 2025.
4. **Payment Terms:**

- a. The district operates on a net 45-day payment policy from the date of service delivery.

**5. Cost Inclusions:**

- a. Detailed breakdown of hardware and hardware installation costs (see included specs)
- b. Hosted cloud service fees.
- c. User account licensing details.
- d. Service, warranty, training, and all associated costs.

**Proposal Requirements:**

Interested vendors are requested to submit a comprehensive proposal that includes the following:

**1. Company Information:**

- a. Company background and experience in providing similar systems.
- b. References from previous clients.

**2. Technical Proposal:**

- a. Detailed specifications of the proposed camera systems.
- b. Installation process and timeline.
- c. Cloud service capabilities and data transfer details.
- d. User account management and licensing information.

**3. Financial Proposal:**

- a. Itemized cost breakdown for hardware, installation, cloud services, and licensing.
- b. Service and warranty terms.
- c. Training programs and associated costs.

**4. Compliance and Certifications:**

- a. Compliance with relevant industry standards and certifications.
- b. Proof of insurance and bonding.

**Submission Instructions:**

Proposals must be submitted by March 31, 2025 to [kwgray@avon-schools.org](mailto:kwgray@avon-schools.org). Late submissions will not be considered. All proposals should be clearly marked with "RFP for School Bus Camera Systems."

**Evaluation Criteria:**

Proposals will be evaluated based on the following criteria:

- Technical specifications and compliance with requirements.
- Vendor experience and references.
- Cost-effectiveness and financial stability.
- Service, warranty, and training offerings.

**Contact Information:**

For any questions or further information, please contact:

- Kevin W. Gray
- Avon Community School Corporation Transportation Director
- Office:317-544-6198

**Conclusion:**

We look forward to receiving your proposal and working together to enhance the safety and security of our school transportation system.

## Appendix A – Technical Evaluation of Proposed Systems

<b>Requirement - Digital Video Recorder DVR</b>
The DVR shall support 6 HD cameras.
The DVR must support H.264 and H.265 video compression
The DVR shall support the following recording frame rates IP cameras, from 1 to 30 fps in 1 frame per second increments. It shall be possible to independently set the frame rate on each video channel.
The DVR shall provide adjustable frame rate, resolution, and video quality settings for each camera independently.
The DVR shall support at least 8 video quality settings for each IP camera independently.
The DVR shall provide the ability to include the following information on the cameras, on-screen display:
Speed
GPS Location
Vehicle Number
Camera Name
Date/Time
Event/Alarm Triggers
The DVR shall support GPS recording in addition to the video/audio channels, it must not cannibalize a video channel.
The DVR must include an internal GPS module. No external cards or boxes will be accepted.
A roof mounted GPS antenna shall be included
The GPS location and speed information must be recorded and synchronized with the video for subsequent analysis and playback.
The DVR must have an internal real-time clock with an automatic Daylight Savings time adjustment.
The Daylight Savings Time methodology must be updateable if the Daylight Savings Time convention ever changes.
The DVR shall sync its internal clock to the GPS time, to display time as per the local time zone.
The DVR shall record up to 6 audio channels (one associated with each video channel).
The DVR shall be configurable to record video with no audio.
The DVR shall be designed, tested, and approved for a rugged mobile environment. The DVR should be administered a shock and vibration test, to a provision of MIL-STD 810G (Trucks on Highways).
The DVR shall have passed ISO 7637-2, Road vehicles — Electrical disturbances from conduction and coupling — Part 2: Electrical transient conduction along supply lines only.
The DVR shall have available, an optional camera extender with RJ45 connectors, regulated 12V DC (nominal) to power the connected IP cameras.
The front panel USB connector shall be a USB Type-A connector.
Connection for the event trigger harness must be via a screw lock connector to the DVR.
Connection for the IP camera must be via a RJ45 connector to the DVR.
The DVR must have status indicator lights on the front panel to indicate the status of the DVR. These lights must include:

Power
Record
USB
Error
Alarm
Network
There shall be options for camera cables of various lengths (up to 60') for connecting IP cameras.
The DVR shall decode a minimum of 1 video channel for local display.
The DVR must use Hard Disk or Solid-State Drives (HDD & SSD) for data storage.
The DVR must support drives up to 4TB in size.
The DVR must be equipped with a 1TB HDD Drive
The DVR shall have a rugged removable drive carrier comprised of metallic housing.
The drive carrier must interface to the DVR using a robust connector – drives utilizing a typical SATA connector shall not be accepted.
The drive carrier must have an integrated thermal management system that warms the drive to its minimum rated temperature specification before data is written/read to the drive.
The drive carrier must have an integrated drive suspension system to reduce the probability of microcracks forming on the internal circuit board of the HDD or SSD.
The connection between the drive carrier and a PC (used to extract video from the storage in the drive carrier) shall be USB 3.0.
The DVR shall accommodate one SD card with capacities up to 256GB
The DVR must be able to store 100 hours of recorded video, audio, and metadata while recording both of the following streams:
Main Stream: 5 Channels, 15FPS, Highest Quality and 720p resolution
Sub Stream: 5 Channels, 5 FPS, Highest Quality and D1 resolution
The DVR shall allow users to download video and/or video of marked events to a USB 2.0 memory stick inserted in the front of the DVR for ease of access.
The DVR shall be capable of powering up at -40°C (-40°F).
The DVR shall be capable of operating within ambient temp of -40°C (-40°F) to +70°C (+158°F).
The DVR shall not incorporate an internal fan.
The DVR shall not have filters that require maintenance or replacement.
The DVR shall support dual streaming. The system shall record high-quality, full resolutions video to the onboard DVR storage while a lower resolution is streamed over the optional cellular or Wi-Fi Connection.
The DVR shall have the ability to record a high-quality, full-resolution version of the video to the storage in the DVR Drive Carrier and a lower-quality, lower-resolution version of the video to the storage in the DVR drive carrier or internal SD card.
The DVR must allow for adjustments of the secondary data stream to allow for the different bandwidths available with 4G and 5G cellular data.
The internal Wi-Fi shall, at minimum, support WPA2, AES encryption, be configurable to 2.4 GHz or 5 GHz, and support IEEE 802.11ac and IEEE 802.11n.

The DVR shall be supplied with a small antenna to support the local connection via Wi-Fi to the android or iOS-based DVR configuration /control application such as Gatekeeper Systems G4 Connect
The DVR shall include an internal web server that allows access to the configuration parameters of the DVR via an ethernet cable or Wi-Fi connection using a web browser.
The DVR must support an external cellular modem
The recorder shall have a keyed electrical interlock that prevents users from inadvertently removing the drive carrier before powering down the DVR.
The DVR shall support input voltages between 8 and 36 VDC
The DVR shall begin recording upon activation of a trigger (i.e., ignition activation).
The DVR shall be equipped with internal supercapacitors, that allow for the continued operation of the DVR system upon sudden power loss. The capacitors shall be able to power the DVR long enough for the recording functions to be shut down in an orderly fashion to avoid data corruption.
The DVR must be configurable to overwrite data or stop recording when the storage is full.
The DVR must be capable of formatting the HDD, SSD or SD card for erasing data if required.
The DVR must include the capability to record up to eight event triggers that can be analyzed upon playback.
The DVR shall include 2 output triggers.
The DVR must have motion detection capability via analog cameras. It shall support the activation of an alarm trigger when movement is detected by the analog cameras.
The DVR shall have a boot time of no more than 60 seconds.
The DVR shall have a minimum 5-year warranty.
The DVR shall be based on an embedded operating system with the ability to upgrade software in the field without return to the manufacturer.
The DVR when equipped with GPS shall automatically update the DVR's real-time clock.
The design of the DVR must be such so that it is secured from drive carrier removal and changing of configuration without the use of a lockbox.
The DVR must include a key lock mechanism that will allow access to the drive carrier when unlocked and simultaneously stops recording to the drive so that it can be safely removed.
The DVR shall include a Driver Alert Button with three LED indicators that show the status of Power, Record and Errors. Pressing of this button shall mark the video for later review.
The DVR shall include a 15' power cable and a 15' multi-conductor sensor cable.
The DVR must have the ability to be accessed wirelessly via a cellular or Wi-Fi connection when the required system components are in place.
The DVR must support the connection to G4 Enterprise and G4 Viewer Plus video management software.
The DVR must support the connection to G4 Vision Health Check
The DVR shall accept firmware updates via a USB stick plugged into the front panel or via an application running on an Android or iOS tablet connected to the DVR via Wi-Fi.
The DVR shall be NDAA compliant.
Requirement Cameras

All cameras must support a resolution of at least 720p (1280 x 720) and the ability to scale down the resolution if required to conserve storage.
All cameras must support up to 30 frames per second (FPS) in One (1) second intervals (i.e., 1 FPS, 2FPS 3FPS, etc.)
The cameras must have integrated infrared illuminators.
The cameras integrated infrared illuminators shall have a range of fifteen to twenty-five (15-25) feet.
Cameras should support a minimum illumination of 0.1lux with no IR and 0Lux with IR turned on.
Cameras signal to Noise shall be ≥40dB.
The cameras shall have an integrated microphone.
The camera's integrated microphone should be able to capture audio between 0 and 15 feet away.
The cameras should be capable of mounting to the ceiling or wall of the vehicle.
The camera should be capable of flush mounting in the ceiling or wall of the vehicle.
The camera housing and mounting technique shall be vandal resistant.
The camera should be able to pan and tilt manually within its enclosure.
The cameras shall operate in temperatures between -22°F to +158°F.
The cameras shall weigh less than 1 lbs.
The forward facing windshield camera must be IP based. Analog or Analog High Definition will not be accepted
<b>Requirement Playback Software</b>
The Video Playback Software must be compatible with the DVR system proposed.
The Video Playback Software shall support a direct connection to the DVR hard drive carrier via USB 3.0.
A user shall be able to view a calendar to display days where there is available video. A user must then be able to select a day to view the video.
A user must be able to identify different types of videos from the calendar view as follows:
Regular video – no alarms
Video with alarms
No video
No video only metadata
The Viewer software must display video time via a linear timeline.
The Viewer software must be able to zoom in (expand the time scale) and zoom out (reduce the time scale) on the timeline to have increased/decreased detail.
The Viewer software shall be able to move the video forward and reverse via grabbing the current time cursor on the timeline.
The Viewer software timeline shall allow users to differentiate regular video vs alarm-based video.
The Viewer software timeline shall graphically display sensor triggers.
The Viewer software must include the following video user controls:
Pause
Play
Rewind
Stop

Slow forward (1/32, 1/16, 1/8, 1/4, 1/2 speed)
Fast Forward (2, 4, 8, 16, 32 times speed)
Previous frame
Frame forward
Volume control
Capture a still image of the selected video
Blur
Zoom
The Viewer software shall be able to generate video clips from the video being played by the following methods:
Select cameras to be included in the clip
Graphically select the start and stop time of the clip
Numerically select the start and stop time of the clip
All clips made by the viewer shall retain all on-screen display data
The software shall support the following export options by the end-user:
Native – this shall include all of the metadata and video in the DVR's native video format
Mini Player - this shall include all of the metadata and video in the DVR's native video format and a reduced functionality viewer that comes packaged with the video
MP4 – the user shall have an option to produce clips (one per camera view) in MP4 format. Metadata does not have to be included.
All clips made by the viewer shall retain all on-screen display data
There shall be a button, or via a right mouse click, the video salvo screen shall be displayed full screen with the following controls still present:
Play
Pause
Reverse
Reduced detail version of the timeline
Once a clip is made in either Mini Player or MP4 format the user shall not be able to remove the blur from the clip.
The user shall be able to produce a still image when the video is paused.
The video management software must be compatible with the DVR system proposed.
The wireless connection must be available through in yard components
The user interface to the server software shall be provided via the same viewer as defined in the Viewer Software requirements section of this document. Therefore shall not be solely web based.
The viewer software must provide the following information:
Listing of vehicles that are configured to function with the server.



A listing of vehicles that are connected wirelessly to the server and are “online” and available.
The user shall be able to select which vehicle to connect to.
Once a vehicle is connected the user shall be able to perform the following functions:
View live video from selected cameras.
Request a lower bandwidth version of the video for transmission over a cellular channel.
Request a full resolution and frame rate (higher bandwidth) version of the video.
Access, modify, and store all configuration settings on the DVR.
Restart the DVR.
Modify and store the GPS data upload frequency.
Get the DVR firmware version.
Remotely format the video storage.
Alarm Generation and Handling-When a wirelessly connected DVR has generated an alarm based on one or more of the following conditions:
The input/output sensor(s) on the DVR.
Inertia alarm on the DVR.
Over-speed alarm - based on the DVR’s GPS data.
Driver Alert Button
Motion is detected in an area defined in a given camera view.
Video loss.
The camera lens was obscured.
Geofence rules being violated – see section above on geofencing.
When an DVR is connected to the video management system via WIFI, the system must be able to perform the following functions upon activation of an DVR input sensor line or activation of the status alert button or the activation of the DVRs inertia sensor:
Open a live video stream of pre-configured cameras to a designated workstation running the video playback software.
Provide real-time alerts in the video playback software.
Download a pre-determined amount of video before the event and after the event. This video should be stored on the server running the video management software.
Video Retrieval:
When an DVR is on and connected wirelessly to the server the user must be able to define the start and stop times, and select video channels to be downloaded to the user’s local PC.
The user must be able to create a download task to store video on the server based on the following parameters:
Date
Start / Stop time
Mainstream or sub stream

Video channel(s)
Option to include or not include metadata (GPS and sensor data)
Video type (all video, non-alarm video, only alarm video)
Specified alarm (see Alarm Generation section above)
The user must be able to create automated download tasks to store video on the server based on the activation of one of the following:
DVR's input sensors
Inertia sensor
Overspeed alarm
Status alert button
Motion detection
Video loss
Camera lens obscured
Geo fence rules being violated
The user must be able to search all video and metadata currently stored on the server. The user must be able to search based on the following parameters:
Date
Time
DVR's input sensors
Inertia Sensor
Overspeed alarm
Status alert button
Motion detection
Video Loss
Camera lens obscured
Geo Location
A user must be able to configure these tasks when the vehicle is not available wirelessly.
If a download is interrupted due to an DVR not being available over a wireless connection the task shall pause and then automatically resume downloading where it left off. It is not acceptable to have to restart the download task from the beginning.
These download tasks must be configurable to occur once or repeated daily, weekly, or monthly.
With the appropriately configured firewall rules the front-end control application shall be able to access the server via the public Internet.
The software should allow for the sending of email alerts to users based on alarm conditions.
The software should allow for the update of DVR firmware remotely.
The software shall allow for the following reports:
GPS Statistics
Alarm Statistics

User Operation Log
Overspeed Report
User Online/Offline Report
Mileage Statistics
Driving Time report
Online Rate Statistics
Driver Alert Report
Motion Alarm Report
Last Status Log
GeoFence Report
IO Alarm Report
Temperature Report
Device Data Flow Report
User Data Flow Report
Data Flow Configuration Report
The application software shall report DVR system health back to a centralized monitoring system as specified.
The Health Check software shall be fully managed by the successful vendor.
The successful vendor shall monitor the software on a daily basis (weekends and Holidays excluded) and report any DVR system defects to the customer in a timely manner.
The health reporting of the DVR shall take place either over a cellular connection
The DVR must be able to report back the following:
A valid video signal from a camera is being received by the DVR. This can be either an analog signal, analog high-definition signal, or data from an IP camera.
The storage device (Hard Drive or SD card) is mounted by the operating system and in the case of a hard drive, the SMART parameters indicate the status of the drive.
The storage device is recording.
The internal temperature of the DVR.
The voltage being applied to the DVR.
The GPS is operating correctly.
The application shall be provided as a hosted service and accessible via a web-browser.
The health check application shall provide a dashboard overview of the fleet.
It shall be possible “drill down” into the health of the digital recording system on a specific vehicle.
The health check system shall track historical faults so that the trending of a vehicle or piece of equipment can be performed.
The health check system shall report the version of firmware on the digital video recorder.
The health check system shall be able to identify when the camera configuration is inconsistent with the cameras connected.
The health check system shall report the storage configuration and health of the drives in the DVR.
The health check system shall enable the mapping of multiple DVRs to a single-vehicle such that DVRs can be located by Vehicle and DVR.

Access to the health check system shall be supported on mobile browsers that are found on cellular telephones and tablets.
The health check system shall produce notifications that can be emailed to designated recipients.
A notification shall support a priority level of 1 (low) 2 (med) and 3 (high).
The health check system shall keep track of DVR configurations and be able to indicate DVR changes that potentially led to an issue. Examples include firmware upgrades, camera additions/removal, and storage drive changes.
Health checks shall provide detailed reports that can be generated for offline analysis.
Health checks shall be able to identify vehicles and DVRs that have not reported their status for a period of time.
Health checks shall provide multiple levels of user access to enable the distribution of monitoring activities to different levels/areas of workers.
Health checks shall support monitoring and reporting of DVRs based on DVR and Depot time zones.
Health checks must be available 24 x 7 in a monitored service environment.
To receive a clear image, the following has to take place:
The camera captures a clear image (test optics of the camera).
The camera converts the image to a valid electrical signal.
The electrical signal makes it to the DVR.
The DVR can encode the signal (in the case of analog or analog high-definition cameras) or that the digital signal is correctly formatted.
The DVR has correctly written the video data to the storage (Hard Drive, SSD, or SD Card).
The DVR has correctly read the video data from the storage (Hard Drive, SSD, or SD Card).
The DVR has correctly transmitted the video data over the wireless link back to the health check system.
The system shall be able to present the current image to the stored image for human evaluation
The user shall be able to exclude specific images from future analysis.
The system shall automatically poll DVRs and pull reference images and snapshots for analysis with no user intervention.
The system shall facilitate user requests for pulling reference images and snapshots manually.
Requirement Cloud Storage
The server for the Video Management, Health Check software shall be hosted in a professional facility that meets the following requirements:
No single point of failure including:
The processing node that is running the video management software
Access to the internet (Multiple Internet Service Providers)
Routers and gateways
Storage
N+1 Environmental Controls:
Redundant UPS
Redundant diesel generators
Redundant A/C

99.99% Availability
Temperature and humidity control systems engineered for Data Centers
The facility must provide 24/7 physical security with only pre-vetted personnel allowed to enter.
Must have a written procedure for information security incident management based on ISO/IEC 27001:2013, clause A.16 information security incident management.
Data must be stored in the USA and all backups must be stored in the USA
The proponent must disclose the location of the server hosting facility
The server hardware and application must be monitored using a commercially available network management system (NMS). The proponent shall disclose the NMS used and an overview of what is monitored by the NMS.